



**WASTE MANAGEMENT**

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Kapolei, HI 96707  
(808) 668-2985  
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February 1, 2011

Bret Moxley  
U.S. Environmental Protection Agency  
Region IX (SFD-9)  
75 Hawthorne Street  
San Francisco, CA 94105

Katherine Baylor  
U.S. Environmental Protection Agency  
Region IX (WST-5)  
75 Hawthorne Street  
San Francisco, CA 94105

Stuart Yamada, P.E., Chief  
Environmental Management Division  
Hawaii Department of Health  
919 Ala Moana Blvd., Room 300  
Honolulu, HI 96814-4920

**RE: Administrative Order on Consent Submittals  
Waimanalo Gulch Sanitary Landfill**

Dear Mr. Moxley, Ms. Baylor, & Mr. Yamada:

Waste Management of Hawaii, Inc. (WMH), the operator of the Waimanalo Gulch Sanitary Landfill (WGSL), is hereby submitting the work plans addressing various sections of the recently signed Administrative Order on Consent for Removal Action (AOC), as listed below.

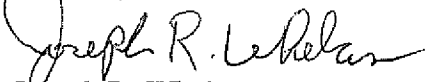
- 1) Section 19d: Description of collection & treatment associated with liquid located behind the temporary berm.
- 2) Section 19e: Work plan for managing any potential hydraulic head in the Cell E6 location.
- 3) Section 19h: Work plan for restoration of the existing sedimentation basin.
- 4) Section 19i: Work plan for the beach assessment and material recovery actions.

*From everyday collection to environmental protection, Think Green.® Think Waste Management.*

- 5) Section 21: Facility health & safety plan. This document is being sent under separate cover due to the large file size.
- 6) Updated Storm Water Management & Contingency Plan (Section (4) of the USEPA letter dated January 27<sup>th</sup> providing approval to resume disposal operations within Cell E6).

Please contact me at (808) 668-2985 with any questions or comments on this submission. We look forward to your approval of these submissions.

Sincerely,

A handwritten signature in black ink, appearing to read "Joseph R. Whelan". The signature is fluid and cursive, with the first name "Joseph" and last name "Whelan" clearly distinguishable.

Joseph R. Whelan  
General Manager  
Waste Management of Hawaii, Inc.

cc: Mr. Wayne Hamada (City and County of Honolulu)  
File

**Section 19d: Description of collection and treatment of temporary berm liquid**

## Collection and Transport of Liquid Behind Temporary Berm – Order 19 (d)

EPA Order: WM shall continue to collect and transport the to a local treatment facility the liquids retained behind the temporary berm in cell E6. WM shall provide a written description of the collection and treatment activities, the current permitting and the chemical parameters of the liquids, and transportation methods to the local treatment facility.

WM began removing storm water that was stored behind the temporary berm in cell E6 via tanker trucks and transported the water to permitted treatment facilities operated by the City and County of Honolulu. Attached is a copy of sample results from the storm water collected at the sediment pond outfall on January 13.

At this point, all free liquids have been removed from behind the temporary berm in cell E6. However, the remaining sediment has liquid-like properties. The remaining sediment will be excavated and hauled to a bermed area on the landfill so that it can dry. Samples were collected of the sediment to determine its ultimate use in the landfill, preferable as daily cover, but landfilled if necessary. Some of the remaining sediment will be placed in several 20,000 gallon mobile storage tanks to attempt to separate the liquid phase from the sediment phase of the material. Any liquid removed through this process will be hauled via a third party hauling company to a County of Honolulu permitted wastewater treatment plant. This process will continue until all recoverable sediment and liquids are removed.

Waimanalo Gulch Sanitary Landfill Storm water Monitoring  
Five Monitoring Stations , 13 January 2011 Discharge Event  
Laboratory Final Data Summary Table - FOR INTERNAL USE ONLY

Method	Analyte	Unit	Screening Criteria	Benchmark Level	CULVERT
1654A	HEM (Oil and Grease)	mg/L	15	15	5.1
40CFR136A 625	Alpha-Terpineol	mg/L	0.016	NA	< 0.01
	Benzolic acid	mg/L	0.071	NA	< 0.05
	p-Cresol	mg/L	0.014	NA	< 0.01
	Pentachlorophenol	mg/L	0.02	NA	< 0.021 *
	Phenol	mg/L	0.015	1.0	< 0.01
EPA 200.7 Rev 4.4	Arsenic	mg/L	0.36	0.16854	< 0.015
	Cadmium	mg/L	0.003	0.0159	< 0.00045 *
	Calcium	mg/L	NA	NA	24
	Iron	mg/L	1.0	1.0	8.6
	Lead	mg/L	0.029	0.0816	0.0034 J
	Magnesium	mg/L	NA	0.0636	13
	Potassium	mg/L	NA	NA	7
	Selenium	mg/L	0.02	0.2385	0.0078 J
	Silver	mg/L	0.001	0.0318	< 0.00093 *
	Sodium	mg/L	NA	NA	73 B
	Zinc	mg/L	0.022	0.117	0.017 J
EPA 245.1	Mercury	mg/L	0.0024	0.0024	< 0.0002
EPA 7196	Hexavalent Chromium	µg/L	16	NA	< 10
EPA 365.1	Phosphorus, Total	mg/L	NA	2.0	0.38 B
MCAWW 350.1	Ammonia	mg/L	4.9	19	0.11
MCAWW 353.2	Nitrate-Nitrite as Nitrogen	mg/L	NA	0.68	2.9
EPA Total Nitrogen	Nitrogen, Total	mg/L	NA	NA	4.8
EPA 405.1	BOD (5-Day)	mg/L	NA	30	8.91
MCAWW 410.4	Chemical Oxygen Demand	mg/L	NA	120	45
SM 2540D	Total Suspended Solids	mg/L	100	100	57
MCAWW 300.0A	Bromide	mg/L	NA	NA	0.73
	Chloride	mg/L	NA	860	95
	Sulfate	mg/L	NA	NA	45 B
SM 2320B	Bicarbonate Alkalinity	mg/L	NA	NA	77
	Carbonate Alkalinity	mg/L	NA	NA	< 5
	Total Alkalinity	mg/L	NA	NA	77
Bac-T	Total Coliform	MPN/100 mL			> 1,600
	E. coli	MPN/100 mL			< 2.0
Field Method	pH	SU	5.5-8.0	6.0-9.0	8.14

Note:

<b>Bold</b>	exceed screening criteria
<b>&lt;</b>	not detected above the reporting limits
<b>&gt;</b>	greater than
<b>*</b>	not detected above the method detection limits
µg/L	micrograms per liter
mg/L	milligrams per liter
B	compound was found in the blanks (0.221 J mg/L for Sodium, 0.0115 J mg/L for Total Phosphorus; and 0.245 J mg/L for Sulfate)
BOD	biochemical oxygen demand
HEM	n-hexane extractable material
NA	no limitation at this time
J	estimated result is less than the reporting limit but greater than or equal to the method detection limit
SU	standard unit

**Section 19e: Work plan for managing potential Cell E6 hydraulic head**

31 January 2011

Mr. Richard T. Von Pein, P.E.  
Waste Management  
9081 Tujunga Avenue  
Sun Valley, CA 91352

**RE: Waimanalo Gulch Landfill  
Work Plan for Evaluating Hydraulic Head Below Liner System**

Dear Mr. Von Pein:

As requested by Waste Management of Hawaii, Inc. (WMH), Geosyntec Consultants, Inc. (Geosyntec) has prepared a Work Plan to evaluate the possibility of excess pressure below the liner system in areas of Cell E6 where water ponded after the storms in December 2010 and January 2011. This Work Plan is a required element of the "Work" pursuant to Section 19.e of the Administrative Order on Consent for Removal Action, CERCLA Docket No. 09-20111-0007/RCRA Docket No. 7003-09-2011-0001.

For reference, the liner system on the side slopes of the expansion area of the Landfill, from bottom to top, consists of:

- Subgrade;
- Soil cushion layer;
- Encapsulated geosynthetic clay liner (GCL) composite liner system consisting of:
  - (i) 40-mil-thick high density polyethylene (HDPE) geomembrane (textured on both sides),
  - (ii) GCL (reinforced, needle-punched, with 2 nonwoven geotextile carriers), and
  - (iii) 60-mil-thick HDPE geomembrane (textured on both sides);
- 16-ounce nonwoven cushion geotextile; and
- Operations layer.

For the floor areas, all the components are the same as for the side slopes, except that a 1-foot-thick gravel layer overlain by a separator nonwoven geotextile is between the cushion geotextile and the operations layer.

## WORK PLAN

To evaluate hydraulic head below the liner, the drilling of up to 6 temporary piezometers to various depths below the existing ground surface is proposed. Figure 1 shows the approximate locations of the piezometers and a table with the estimated ground elevation and the estimated drilling depth to reach below the liner level. These drilling depths will need to be confirmed at the time of drilling to verify that the appropriate elevation will be achieved. Piezometer locations may be adjusted in the field as needed with concurrence by the engineer.

As can be observed, the piezometers are located around the perimeter of Cell E6. The locations of the piezometers will need to be located away from buried utilities such as the 18-inch and 36-inch HDPE surface water conveyance pipes. The borings are planned to be outside the lined area except where the liner has been damaged and must be replaced. The as-built locations of the utilities (buried or on the surface) will need to be established before drilling begins.

After the drilling has been performed, and if saturated conditions are encountered, piezometers will be installed under the supervision of either a geotechnical engineer or a hydrogeologist who will also monitor the water levels. If saturated conditions are not encountered, the number of borings/piezometers may be reduced.

## DOCUMENTATION

At each temporary piezometer location, documentation should consist of the following:

- 1) Water level (if any) at the time of drilling when water first encountered.
- 2) Water level after stabilization/construction of any temporary piezometers.
- 3) Piezometer construction log (only required if saturated conditions are encountered) (i.e., surveyed ground surface elevation, depth of casing below the ground surface, perforated length or gravel pack area, stickup above the ground surface, etc.). The installer of the standpipe needs to have an adequate supply of pipe and the ability to maintain it vertical to accommodate artesian conditions if encountered.
- 4) Photographic documentation of the various piezometers.
- 5) Monitoring of water level at each piezometer during a 24-hour period after installation. The objective is to record increases, decreases, or no movement of the water level with time. If the water level does not change, the piezometer can be decommissioned after 72 hours or after obtaining approval from the engineer. If hydraulic heads are observed, the locations will need to be monitored for longer periods and a plan will need to be prepared to relieve these pressures over time.
- 6) After the monitoring period is finished, the temporary piezometers will need to be decommissioned by filling in the boring with a cement/bentonite mix.



A report summarizing the findings will need to be prepared by the professional under whose supervision the work was performed. Based on water levels, if any are encountered, WMH will develop needed remedial measures, which could include temporary extraction wells.

## **SCHEDULE**

Installation of the piezometers will depend on the progress of the ongoing slope excavation and cleanup of the lower portion of the E-6 cell. At this time, only piezometers PZ-5 and PZ-6 will be installed. WMH anticipates drilling in this area within 5 days. Due to a potential rockfall hazard in this area related to the west diversion channel construction, this work will need to be coordinated with diversion channel construction. As soon as WMH can gain access to the southern portion of cell E-6, following removal of mud in this area, WMH will drill PZ-1 and if necessary install a piezometer at this location. WMH anticipates that installation of this boring would be in approximately 20 days.

If WMH does not encounter water in PZ-1, PZ-5, or PZ-6, no additional borings would be completed. If needed, PZ-2, PZ-3 and PZ-4 would be installed after loose rock is removed from the slopes above this area. WMH anticipates that completion of the western diversion channel and removal of loose rock from the slope will take approximately 45 days.

Please contact us if there are further questions.

Sincerely yours,

Hari D. Sharma

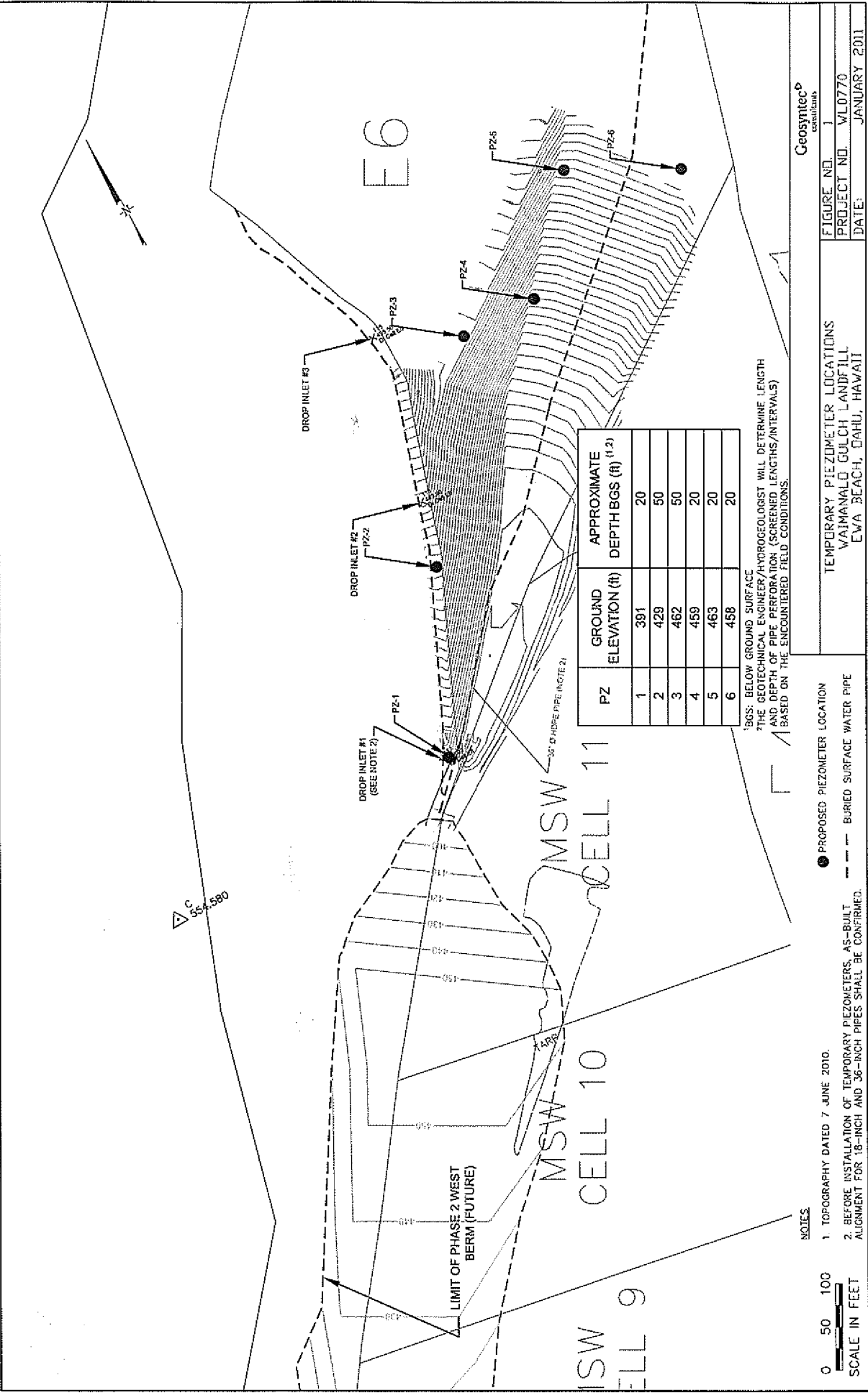
Hari D. Sharma, Ph.D., P.E.  
Principal

## **ATTACHMENT**

Figure 1 -- Proposed Temporary Piezometer Locations

## **COPY TO**

Mr. Joseph Whelan (WMH)  
Mr. Jesse Frey (WMH)



**Section 19h: Work plan for restoration of sedimentation basin**

2



180 Grand Ave, Ste 1410  
Oakland, California 94612  
510-350-2900  
FAX 510-350-2901

January 31, 2011  
Project Number 070181

Waste Management  
Richard T. Von Pein, P. E.  
Director of Engineering, Western Group  
6640 Amber Lane  
Pleasanton, CA 94566

**Subject: Work Plan for Sedimentation Basin Restoration- Waimanalo Gulch  
Sanitary Landfill, Ewa Beach, Oahu, HI (Draft)**

Dear Mr. Von Pein,

As requested, GEI Consultants (GEI) has prepared a work plan to restore the sediment basin system to its intended capacity and function after the occurrence of the recent storm events in December 2010 and January 2011.

### Sedimentation Basin Features

The sedimentation basin was originally designed and constructed in the late 1980's. Recently (2006-2007), there were several modifications made to the basin including the placement of an interior pond retention berm, swale energy dissipation improvements, installation of a subdrain system, and replacement of the two 42-inch corrugated metal riser pipes with concrete risers. Attachment A includes a copy of the design drawings by Shimabukuro, Endo, and Yoshizaki, Inc. showing the original basin design, and EarthTech drawings showing the recent modifications. Attachment B includes photographs of the basin in October 2007 after construction of the basin modifications.

The sedimentation basin currently receives drainage that is collected in the western concrete-lined drainage channel immediately upstream of the basin. The sedimentation basin consists of the following elements, described in an upstream to downstream direction:

- **Sedimentation Basin Inlet Apron** - The inlet located at the downstream end of the western concrete lined drainage channel consists of a 30-foot long rock riprap apron. The rock riprap sizes are approximately 18 to 24 inches in diameter.

- **Northern Basin and Interior Berm Area** – A riprapped interior berm is located in the northern (upstream) portion of the basin. The interior berm is approximately 4 feet high. The northern basin area and interior berm function as a pre-holding area to reduce the amount of coarser sediment that will continue to travel downstream in the basin, and possibly reduce the hydraulic mixing and churning of the finer sediment in the southern basin. The approximate elevation of the basin floor in this area is El. 65. The basin side slopes adjacent to the floor are inclined at 2 horizontal to 1 vertical (H: V), and the total depth of the basin in this area is approximately 18 feet. There is also a riprapped energy dissipator at the northeast corner of the basin to reduce exit velocities from 18-inch and 42-inch storm water pipes exiting into the basin at this location.
- **Southern Basin Area** - The southern portion of the basin contains a subdrain system beneath the basin floor to lower and discharge the standing water in the basin during low flow events. The subdrain system consists of 6-inch, perforated high density polyethylene (HDPE) pipes placed in an 18-inch wide by 24-inch deep infiltration trench wrapped in a filter cloth. The trench is backfilled with ½ to ¾-inch drain rock with an overlying 6-inch sand bedding layer at the base of the sedimentation basin. The HDPE pipes are connected directly to the CMP outlet pipes (described below) to allow for conveyance of drainage from the subdrain system.

The basin side slopes adjacent to the floor are inclined at 2 horizontal to 1 vertical, and the total depth of the basin in this area is approximately 18 feet. However, the earthen embankment at the downstream end of the pond is approximately 4.5 to 5 feet lower, to form an emergency spillway crest for the sedimentation basin (see riprapped embankment and spillway description below).

- **Outlet Riser Pipes** - There are two reinforced 48-inch diameter concrete inlet riser pipes that function as principal outlets for the sedimentation basin. The riser pipes were constructed without intermediate orifice openings, so drainage of basin inflow will be through the overflow outlet at the top of the riser or through the underlying subdrain system described previously. The vertical riser pipes outlets connect via a concrete box to 42-inch diameter horizontal corrugated metal pipes (CMP's) located at the base of the embankment at the downstream end of the sedimentation basin. The CMP's outlet on the spillway apron at the downstream toe of the embankment.
- **Riprapped Embankment and Spillway** - An earthfill embankment was constructed at the south end of the basin to provide containment on the downstream side of the pond. The embankment is armored with a 2' thick layer of grouted riprap. The crest and downstream slope of the embankment functions as a spillway apron to discharge storm water downstream from the basin. The embankment was constructed with 2 H to 1 V sideslopes and a crest width of approximately 19 feet. The inboard sideslope of the embankment is

approximately 14 feet high. The outboard side of the embankment is approximately 21 feet high.

- **Vegetated Drainage Corridor** - A vegetated area is located downstream of the spillway apron and the 42-inch CMP pipe outlets. The vegetated area is approximately 200 feet long by 50 to 100 feet wide and conveys storm water flows downstream to three CMP culvert outfalls beneath Farrington Highway.

### Work Plan Activities

In order to restore the basin to its intended capacity and function, specific activities will be performed for the features described previously. These activities are described in more detail and are currently being implemented or will be implemented as soon as possible after the basin is dewatered.

- **Basin Pumping** - Prior to cleaning and inspection of the sedimentation basin features, all standing water will be pumped from the basin and discharged at a POTW designated by the City and County of Honolulu.
- **Basin Inlet Apron** - All sediment and debris on top of the energy dissipator and interior berm will be removed until the underlying riprap apron and berm armoring are exposed. Any riprap missing from this area will be replaced with 18-inch to 24-inch diameter rock. The riprap will consist of basalt material with good rock quality obtained from the on-site excavation activities within the landfill.
- **Northern Basin and Interior Berm Area** - The sediment and debris from the basin will be removed to restore the basin floor to the design elevation of El.65.0. Any sediment that collected against the toe or side slopes of the basin will be removed to restore the basin slopes to their design 2 H to 1 V inclination and the basin floor width to the design dimensions shown in Attachment A. The riprap armoring on the interior berm and energy dissipation swales will be fully uncovered and inspected to determine if there are areas of dislodged or missing riprap. Any areas of missing riprap will be replaced. The riprap will consist of on-site material as described previously. After drying, sediment will be used for daily cover and debris will be disposed in the landfill.
- **Southern Basin Area** - The sediment and debris from the basin will be removed to restore the basin floor to the design elevation of El.65.0. Any sediment that collected against the toe or side slopes of the basin will be removed to restore the basin slopes to their design 2 H to 1 V inclination and the basin floor width to the dimensions shown in Attachment A. After removing sediment from the basin floor the subdrain trenches will be located and the 6" washed sand layer on the basin floor covering the subdrain system should be replaced. The concrete inlet riser pipes and steel trash racks will be visually inspected for debris or sediment blockage. If blockages are observed, they will be removed from the risers and

trash racks. The 42-inch CMP outfall beneath the embankment will be visually inspected for debris or sediment blockage. All sediment and debris should be removed from the CMP outfall pipes. After drying, sediment will be used for daily cover and debris will be disposed in the landfill

- **Riprapped Embankment and Spillway** - As a result of the December 2010-January 2011 storm events, sediment may have accumulated against the grouted riprap on the inboard and outboard faces of the embankment and spillway area. Any accumulated sediment in these areas will be removed and disposed properly in the landfill. Disposal may include using the material for daily cover. The overflow spillway will also be visually inspected for signs of debris that is blocking the overflow weir or that has migrated on the downstream face of the weir. All debris in the spillway will be collected and deposited in the landfill.
- **Vegetated Drainage Corridor** - The area immediately downstream of 42-inch CMP pipe outfalls and riprap apron was protected in the past with rock riprap. The riprap was placed to allow for stormwater discharge to dissipate and spread throughout the vegetated area before leaving the site. These riprap areas will be inspected, and any missing or dislodged riprap will be replaced. On-site rock material will be used as described previously. All debris that migrated into the drainage corridor will be removed and disposed in the landfill.
- **Sediment and Debris Disposal** - All sediment and debris removed from the areas described previously should be disposed in the landfill. Sediment will be stockpiled and allowed to dry. The dried sediment material can then be utilized as daily and intermediate cover during landfilling operations.
- **Implementation of Work Plan** - Waste Management will implement the work plan described using available site personnel and contractors. Inspection will be performed by AECOM engineers as required.
- **Documentation of Work Plan Activities** - Photo-documentation and field reports will be prepared by landfill personnel during and after restoration activities to support final reporting efforts of work plan implementation to the USEPA.

**Schedule** – Liquids are scheduled to be removed from the pond by February 14<sup>th</sup> provided there is no additional rainfall. After liquids are removed removing sediment, debris and silted-in underdrain material will occur. As soon as all material is removed from the pond, the underdrain will be reconstructed, other necessary repairs made and the pond put back into service. We anticipate removing the sediment and debris, and reconstructing the pond will take approximately 4 weeks and should be completed by March 14, provided we do not receive significant additional rainfall. If storm water enters the basin prior to the removal of the sediments, we would not discharge it as storm water, except in an emergency. The water will be removed and transported to a POTW designated by the City and County of Honolulu.

Very truly yours,  
**GEI Consultants, Inc.**

A handwritten signature in black ink, appearing to read 'W. Rettberg', with a long horizontal stroke extending to the right.

William A. Rettberg, P.E.  
Vice President

- Attachment A: Drawings by Shimabukuro, Endo, & Yoshizaki, Inc. and Earth  
Tech Depicting Basin Configuration and Features
- Attachment B: Photographs of the Sedimentation Basin Area in October 2007  
After Construction of Modifications



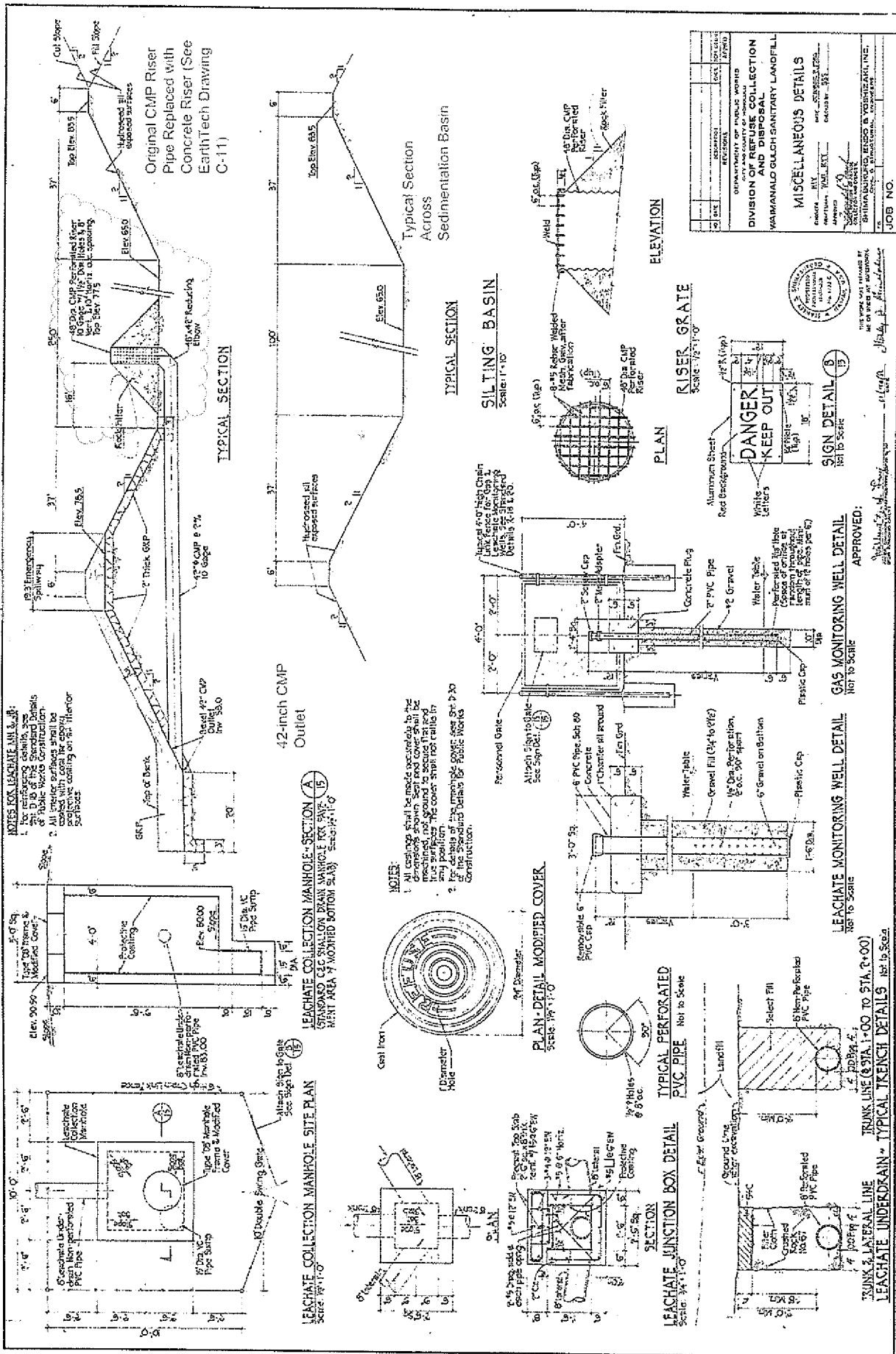
## **ATTACHMENT A**

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**Drawings by Shimabukuro, Endo & Yoshizaki, Inc. and EarthTech  
Depicting Basin Configuration and Features**



# Riprapped Embankment and Spillway



DEPARTMENT OF PUBLIC WORKS	
DIVISION OF REFUSE COLLECTION AND DISPOSAL	
WAMALLO GULCH SANITARY LANDFILL	
MISCELLANEOUS DETAILS	
PROJECT NO.	100-1000
DATE	10/1/80
BY	W. J. B. J.
CHECKED BY	W. J. B. J.
APPROVED BY	W. J. B. J.
ENGINEER: W. J. B. J.	
SUPERVISOR: W. J. B. J.	
JOB NO.	

## **ATTACHMENT B**

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### **Photographs of Sedimentation Basin Area in October 2007 After Construction of Modifications**



View of Basin Looking South Along the Western Concrete-Lined Drainage Channel



View of Sedimentation Basin Looking North



View along Riprapped Embankment Crest Looking West



View of Basin Looking Northeast from Riprapped Embankment Crest



**Section 19i: Work plan for beach assessment & material recovery effort**

2

Beach Assessment and Recovery – 19(i)

EPA Order: WM shall provide to EPA and DOH a work plan and schedule for ongoing daily beach assessment and recovery of waste material released from WGSL.

In response to the stormwater release that carried waste material from the WGSL on January 13, 2011, WM has implemented a beach assessment and cleanup. On January 13, 2010, "Potentially Contaminated Water" warning signs were posted near the outfall and the surrounding beaches by the City and County of Honolulu. The initial assessment on January 14, 2011 was focused on the stormwater outfall that carries the waters of the WGSL drainage basin. WM continued assessment on January 15 at the outfall and on January 16, WM began covering several nearby beaches that had reports of observed waste. WM performed daily assessments and cleanup as necessary daily until January 21, 2011 and because the amount of waste observed diminished drastically, suspended the daily assessment. On January 24, WM performed one final assessment and observed no waste that could have been attributed to the WGSL. WM will continue to respond and track reports of waste on the nearby beaches. Attached is a log of recovered waste from the beaches and the WGSL outfall and a log of phone reports of waste.

## MEDICAL WASTE SIGHTING LOG:

<u>DATE</u>	<u>NAME</u>	<u>PHONE #</u>	<u>WHEN, WHAT AND WHERE SEEN</u>
1/17/2011	Sue Ellen	673-1922	1/16/11 seen a syringe on the beach in Nanakulu directly across Hakimo Rd.
1/17/2011	John Merritt	864-7482	1/17/11 seen syringes and cotton at all 4 lagoons at Ko'Olina
1/18/2011	Lawton	368-2004	1/17/11 seen syringes with and without needles and some sediment at Ko'Olina lagoon 3
1/20/2011	Wayne Yamamoto	388-1236	1/20/11 seen a syringe without needle on beach fronting Paradise Cove ... prefers not to handle himself
1/24/2011	Charles Lopez	696-3069 or 333-7075	1/17/11 lifegaurds at Pokai Bay found 4 -5 syringes ... he heard from a reliable source of his that medical waste trucks were seen dumping their waste in sewer lines in Maile and Pokai Bay ... is that true? AWould like to know if the City has documentation regarding disposal whereabouts? Why were no signs posted at Pokai Bay that beach was closed, there were signs at the Army Rest Camp Beach a couple miles away? Army Rest Camp took samples and found lots of bacteria. He tried contacting City via phone/email ... got no response.
1/26/2011	Lene of DOH	586-4226	Someone (Carroll Cox) reported seeing medical waste at WGSJ stormwater outlet at Ko'Olina ... don't know when it was seen or if it had already been cleaned-up.

Date	Location	Debris/Typical Ocean Trash (No. of 40 gallon bags)	Medical Waste
13-Jan	Stormwater Sampling, and Warning Signs Placed	0	0
14-Jan	WGSL Storm Drain Outlet	20	1 gallon bucket full
15-Jan	WGSL Storm Drain Outlet	10	2 syringes, 1 vial
15-Jan	White Plains Beach	5	1 syringe
16-Jan	WGSL Storm Drain Outlet	0	1 syringe
16-Jan	White Plains Beach	2	2 syringes, 1 vial
17-Jan	White Plains Beach/Nimitz Beach	1	2 syringes
17-Jan	Pokai Bay	0	0
18-Jan	White Plains Beach/Nimitz Beach	4	0
18-Jan	White Plains Beach/Nimitz Beach	10	2 syringes
18-Jan	White Plains Beach/Nimitz Beach	0	1 syringe
19-Jan	White Plains Beach/Nimitz Beach	0	0
19-Jan	Pokai Bay	0	1 syringe, 1 vial
19-Jan	Kahe Beach/Tracks/WGSL Discharge/HECO Discharge	0	0
20-Jan	Kahe Beach/Tracks/WGSL Discharge/HECO Discharge	0	1 syringe
20-Jan	Ko Olina (Paradise Cove)	0	0
20-Jan	White Plains Beach/Nimitz Beach	0	0
21-Jan	White Plains Beach/Nimitz Beach	0	0
21-Jan	Kahe Beach/Tracks/WGSL Discharge/HECO Discharge	0	0
24-Jan	Kahe Beach/Tracks/WGSL Discharge/HECO Discharge/Paradise Cove	0	0
24-Jan	White Plains Beach/Nimitz Beach	0	0
26-Jan	WGSL Storm Drain Outlet (at request of DOH in response to personal report)	0	0

**Revised Storm Water Management Update & Contingency Plan**

## **Waimanalo Gulch Sanitary Landfill Stormwater Management Update and Contingency Plan 2-1-11**

Following the recent major storm events, Waste Management of Hawaii (WMH) has assessed and evaluated its stormwater control systems for effectiveness. Below is an update of ongoing measures being taken to prevent future storm damage at the site, and document efforts to further contain potential storm water. WM believes that these measures will prevent waste material and storm water that may have come into contact with waste from exiting the facility in the event of a major storm.

- 1) The 36-inch drain was designed to handle water falling within the landfill footprint, upstream of the waste disposal area, during landfilling operations. It was also intended to mitigate runoff during small storms until the diversion channels are in place. The west side drainage channel has been designed to control the 100-year storm and will mitigate the impact of storms with higher return periods.
  - The effectiveness of 36-inch inlet structure for the up canyon drainage system has been restored and improved. The area immediately surrounding the inlet structure has been re-graded and armored with large boulders to prevent high sediment loading from clogging the inlet. A diversion berm immediately downstream of this diversion structure has been reinforced and re-built to further direct any stormwater into the inlet structure.
  - The area surrounding the future Cell E-8 is being excavated down to the elevation of the 36-inch pipe inlet structure. This effort will help to create stormwater retention, dissipate stormwater velocities, and drop out sediment as it moves from the upper reaches of the construction area towards the 36" inlet structure. This effort has been ongoing since 1/18.
  
- 2) Temporary containment berm directly south of Cell E6

This berm was constructed by WMH's contractor during the 12-19-10 storm to contain large stormwater flows originating from up canyon and prevent a catastrophic discharge from exiting the site. The berm did safely contain this storm, and was subsequently substantially reinforced prior to the storm that occurred on 1-13-11. The storm water that was contained behind the berm has now been removed, creating a storage area capable of containing water from a similar rainfall event. Preliminary stability analysis indicates the berm has adequate strength to contain the runoff.
  
- 3) Establish a functioning Western Drainage System.

In order to establish a functioning Western Drainage System, the up canyon conveyance structure must be in place to divert storm water into the box culvert and fiberglass piping system. Additionally, the box culvert invert that originates at the diversion structure must be connected to the 78" fiberglass piping located on the upper bench above Cell E-6. WMH's contractor continues to work double shifts on these two fronts. A functioning Western Drainage System will be in place within 2 weeks, barring any additional large rainfall events that would prevent this work from being safely completed.

- 4) WM employees monitor weather conditions routinely, in order to prepare for and take emergency action in the event of a major storm event affecting the site. WMH has reviewed our Storm water Pollution Control Plan (SPCC) and will update accordingly as the western storm water diversion project progresses.
- 5) Interim storm event management

Section (4) of USEPA's letter dated January 28, 2011, approving resumption of landfill operations within specified areas of Cell E6, contains a requirement that WMH list available equipment and personnel to be deployed in response to major storm events that may occur prior to the functional completion of the west side drainage diversion project. These capabilities are listed below.

- The WMH general contractor for the west side drainage diversion project maintains on site six excavators, six articulated dump trucks, four bulldozers, three front end loaders, two 8 inch diameter and one twelve inch diameter pumps. In addition WMH maintains three bulldozers, one front end loader, one road grader, two articulated dump trucks, one backhoe, one fuel truck, one lube truck, and one six inch diameter pump.
- Joe Whelan, Justin Lottig, Jesse Frey, and Rick Kahalewai are available to assist in managing storm water management, in addition to four equipment operators and two maintenance technicians. Additionally, the general contractor maintains appropriate operators for all equipment listed above.
- WMH employs a security service which is on site after business hours seven days per week who are responsible for alerting WMH management in the event of a major after hours storm event. During business hours the above listed WMH employees and the general contractor maintain sufficient trained employees to respond to storm events.
- The sedimentation basin, temporary berm in the Cell E6 area, 36 inch storm water diversion piping, and general facility drainage ditches will be monitored and maintained during potential storm events.
- In the event of a major storm event, WMH employees and contractors will assess on site conditions to determine if there is a potential threat to human life or injury, as well as equipment damage, or environmental harm as a result of the storm. WMH will take appropriate actions to keep all ditches and storm water conveyance structures operational and free of debris, once it is determined that these activities can be performed safely. WMH will monitor the condition of the Cell E6 berm in relation to the amount of storm water that may have ponded behind this dam,
- Should a release of solid waste material occur, WMH employees will monitor the existing storm water outfall location and initiate beach assessments, clean up activities, and post signs in those areas likely to be affected by a release.